Journal of Ethnobiology 21(2): 1–27 Winter 2001

ETHNOBOTANY OF KU-NU-CHE: CHEROKEE HICKORY NUT SOUP

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ABSTRACT.—A traditional hickory nut soup called ***ku-nu-che*** is consumed by many Cherokee people in eastern Oklahoma. A limited number of producers go through a two-stage process of cracking and pounding the nuts—primarily *Carya texana*—into a mixture of nutmeat and nutshell fragments that they form into balls for distribution to other households. Before being served as soup, these balls are dissolved in boiling water, strained to remove the nutshell fragments, mixed with cooked rice or hominy, and sweetened or salted. We interviewed six makers of ***ku-nu-che*** balls and describe their tools, their methods, and their motives for engaging in this labor-intensive practice. We also surveyed other tribal members to ascertain what ***ku-nu-che*** means to Cherokee people today. This study documents long-term persistence of an ancient Native American plant food and, in addition, has implications for the interpretation of plant remains from archaeological middens.

Key words: hickory nuts, ethnobotany, Cherokee Indians, Native American food plants, paleoethnobotany.

RESUMEN.—Una sopa tradicional preparada de nogal americano llamada ***ku-nu-chee*** es consumida por mucha gente Cherokee de Oklahoma oriental. Un número contado de personas usan un proceso de preparación en dos etapas. Primero, quiebran la cascara y después muelen la nuez (especie principal *Carya texana*) para formar pelotas de una mezcla de fragmentos de cascara y nuez molida que distribuyen a otras familias. Antes de ser usada para sopa, las pelotas se deshacen en agua hirviendo, se cuelan para separar los fragmentos de cascara, se mezcla con arroz o maíz cocido y se agrega sal o azúcar. Se presenta información de seis entrevistas con personas que se dedican a la labor de preparar pelotas. Se describen sus herramientas, sus métodos y sus motivos para hacer esta actividad muy laboriosa. También sondeamos a otros miembros del tribu sobre el significado de ***ku-nu-chee*** para la gente Cherokee en la época actual. Este estudio documenta la persistencia larga de una comida tradicional indígena norteamericana y tiene implicaciones para la interpretación de restos botánicos de basureros arqueológicos.

RÉSUMÉ.—La soupe de *Carya* spp. appelée ***ku-nu-che*** est consommée par de nombreux Cherokees dans la partie Est de l'Oklahoma. Une petite partie des producteurs adopte un processus en deux étapes de craquage et écrasement des noix (surtout *Carya texana*) pour en faire un mélange de pulpe de noix et de coquille, ensuite moulé en boules qui sont distribuées à d'autres familles. Pour préparer la soupe, ces boules sont dissoutes dans l'eau bouillante, filtrées pour en enlever les morceaux de coquille, mélangées à du riz cuit, puis sucrées ou salées. Nous avons interviewé six producteurs de boules de ***ku-nu-che***. Nous décrivons leurs méthodes, leurs outils, et les motifs pour lesquels ils se consacrent à cette tâche intensive. Nous avons aussi interrogé d'autres membres de la tribu pour comprendre la signification du ***ku-nu-che*** pour les Cherokees aujourd'hui. Cette étude fournit des données sur la persistence à long-terme d'une plante nutritionelle ancienne des Indiens d'Amérique, et a aussi des implications en ce qui concerne l'interprétation des residus de plantes dans les fouilles archéologiques.

INTRODUCTION

Cherokee people moving into northeast Oklahoma in the 1820s and 1830s were probably relieved to find an abundance of hickory trees (*Carya* Nuttall spp.) (Juglandaceae). Hickories would have been a welcome sight because nuts of thick-shelled species were—and still are—the basic ingredient of a traditional soup-like dish known as ***ku-nu-che*** (or "ga-nu-ge" or "conutchie" or "kinugee," among other variants). Hickory nuts had been a dietary staple in the Eastern Woodlands for thousands of years before the transition to American Indian agriculture, and the nuts remained a central ingredient in cuisines of indigenous farming societies before and after the arrival of Europeans. ***Ku-nu-che*** is still today prepared in the households of members of the Western Cherokee Nation, with its seat of government in Tahlequah, Oklahoma, and those living in the southern Appalachian Mountains, homeland of the Cherokees before most were forced west in the early nineteenth century, before and during the Trail of Tears in 1838–1839.

This study began primarily as an attempt to observe modern hickory nut processing in order to gain insights into the ways hickory nutshell entered the archaeological record. Archaeologists look to ethnographic and ethnohistoric descriptions of plant use in order to understand better how plant remains and artifacts may have been deposited in archaeological sites; in other words, to gain taphonomic and contextual insights. Interest by archaeologists in traditional foodways increased during the 1970s and 1980s in conjunction with ecological approaches to archaeology, accompanied by large-scale recovery of plant and animal remains through newly developed methods including flotation. Hickory nutshell is the most abundant type of food plant in many archaeobotanical assemblages, sometimes outweighing the ubiquitous wood charcoal. This is especially true for samples from the Archaic period (8000–1000 b.c.e.), but some Mississippian period (1000 c.e. to European Contact) sites are also dominated by thick hickory nutshell. Archaeologists have looked to historical and early ethnographic sources for descriptions of native nut processing techniques, but none have, to our knowledge, considered the living Cherokee men and women who gather hickory nuts and make ***ku-nu-che*** every year.

The fact that this food is still made and consumed by many Cherokee people today says a great deal about persistence of native values and appreciation of long-standing traditions. Although it might seem as if this particular tradition is in danger of disappearing, we found evidence to indicate that, because so many Cherokees continue to appreciate ***ku-nu-che***, the incentive exists to ensure its availability in the foreseeable future. Our objectives are, therefore, both ethnobotanical and ethnoarchaeological: to document in as much detail as possible contemporary ***ku-nu-che*** making processes as practiced by Cherokees in and around Tahlequah; to discuss the meaning and significance of ***ku-nu-che*** in modern Cherokee society; and to explore the ecological and archaeological implications of the harvesting and processing of hickory nuts by Cherokee people today.

KU-NU-CHE IN MODERN CHEROKEE COUNTRY, OKLAHOMA

Most adults and teenagers, and even many children, who live or grew up as members of a Cherokee community in northeastern Oklahoma are aware of *ku-nu-che*. They may not eat it often, but it is available at gatherings such as holiday and birthday dinners, church socials, and family reunions. ***Ku-nu-che*** is usually distributed in the form of balls (Figure 1), which can be purchased directly from individuals who process the raw nuts. ***Ku-nu-che*** balls are also sold at tribal health clinics, community grocery stores, and Cherokee Nation governmental offices. As a friend of one of our consultants said during an interview in Tahlequah, "When



FIGURE 1.—Uncooked ***ku-nu-che*** ball on right; nutshell sifted from one cooked ***ku-nu-che*** ball in front; undissolved nutmeat sifted from cooked ***ku-nu-che*** ball on left; cooked hickory nut soup in jar at rear. Note: one ball mixed with water and hominy or rice fills two or three jars.

you get away from here, nobody knows about ***ku-nu-che***, but around here, everybody knows it."

Whitekiller (second author of this paper) recalls that ***ku-nu-che*** was made from scratch, starting with nuts collected from trees in and near their yards, by members of her grandparents' generation living in the cluster of homes and gardens owned by the extended Drywater family on the outskirts of Tahlequah. McIntosh (third author of this paper) remembers a jar of cooked ***ku-nu-che*** soup often being available in the refrigerator of his grandparents' rural home in Mays County when he was growing up. Grandchildren and other family members were free to help themselves to cold or reheated ***ku-nu-che*** as a snack whenever they desired. ***Ku-nu-che*** was (and still is) commonly served at church dinners. Members of the congregation serve themselves from a large pot, usually ladling it into styrofoam cups using a gourd dipper or large spoon. One of Whitekiller's brothers was such a frequent visitor to the ***ku-nu-che*** pot as a child that he was jokingly called "***ku-nu-che*** boy" by the other Cherokee children playing nearby. The richness of this dish, however, causes most people to consume it in moderate amounts.

Ku-nu-che balls are made by a limited number of Cherokees. Many others buy the balls, which tend to be about the size of softballs, for approximately $5.00 to $6.00 each. The price of a ***ku-nu-che*** ball a few decades ago was $2.00. People who actually gather, crack, and pound hickory nuts and make ***ku-nu-che*** balls for distribution to others have special tools, although individuals who make a few balls each year for use by the immediate family may use only common household tools such as hammers or mallets. Sellers of ***ku-nu-che*** balls have been known to advertise on local call-in radio swap-meet shows or in newspapers that specialize in non-retail, person-to-person sales. Most knowledge about availability is, however, spread by word of mouth.

After providing historical background information, we introduce six serious ***ku-nu-che*** makers and tell how, where, and why they produce and distribute balls. We follow them through the steps of gathering or acquiring the nuts from others, of cracking, sieving, pounding, and forming the balls, of distributing (usually selling) the balls, and of cooking them. We then discuss motives for making ***ku-nu-che*** today and assess attitudes of Cherokee teenagers that make us optimistic about the survival of this traditional food. Finally, we briefly explore the archaeological implications of modern ***ku-nu-che*** making.

ARCHAEOLOGICAL, HISTORICAL, AND NUTRITIONAL BACKGROUND

The archaeological record attests to the importance of hickory nuts in subsistence strategies of native peoples in the Eastern Woodlands as far back as Late Paleoindian times, 8300 b.c.e. (Detwiler et al. 1998). Middens dating to the Middle and Late Archaic periods, 6000–1000 b.c.e., typically contain masses of charred hickory nutshell, indicating that hickory nutmeat was a staple food, possibly the single most important plant food for many Woodland foragers (Asch, Ford and Asch 1972; Gardner 1997; Lopinot 1982; Yarnell and Black 1985). Prodigious amounts of charred hickory nutshell in archaeological sites might exaggerate the dietary importance of this resource due to its mass, its density and subsequent durability, and to the likelihood that cracked pieces of nutshell were deliberately

burned more often than the remains of other food plants that do not make useful fuel. Even so, the "nutritional superiority" (Gardner 1997:175) in terms of caloric content and protein complement of hickory nuts over other nuts reinforces the claim that hickories were a "first-line" food resource (Asch, Ford, and Asch 1972) for foragers in what is now the eastern United States. Gardner (1997) points out that only 340 g dry weight of hickory nutmeat is required to supply 2200 kcal intake, compared to 427 g of acorn and 604 g of maize. The fat content of hickory nuts is double that of acorns and approximately sixteen times that of maize, a fact that "may have been of considerable nutritional importance to Eastern Woodlands foragers" (Gardner 1997:162). Hickory nuts are higher than either acorns or maize in eight out of the ten essential amino acids, falling only slightly lower than maize in leucine and slightly lower than acorns in lysine (Gardner 1997:164).

An assemblage of human paleofeces from Salts and Mammoth Caves in Kentucky demonstrates that hickory nuts were frequently consumed during the middle first millennium b.c.e., at a time and place where native seed gardening had been integrated into the economy of hunters and gatherers (Yarnell 1969). Munson (1986) and Gardner (1997), in fact, hypothesize that management of nut groves (girdling and clearing to favor highly productive trees) was ecologically conducive to local domestication of plants such as sumpweed (*Iva annua* L.) and chenopod (*Chenopodium berlandieri* Moq.). Southeastern American Indians did not abandon nut harvesting even after intensification of maize (*Zea mays* L.) agriculture at 800–1200 c.e. Early European explorers and entrepreneurs enjoyed hickory nut foods and oils (Battle 1922; Talalay et al. 1984), and described groves near Indian villages where nut trees were managed in an orchard-like fashion (Hammett 1992).

Several European observers described the pounding of nuts and rendering of milk-like emulsion and oil. William Bartram, who lived among the Creeks in Georgia at the close of the eighteenth century, wrote:

> I have seen above an (sic) hundred bushels of these nuts belonging to one family. They pound them to pieces, and cast them into boiling water, which, after passing through fine strainers, preserves the most oily part of the liquid: this they call by a name which signifies Hiccory milk; it is as sweet and rich as fresh cream, and is an ingredient in most of their cookery, especially homony and corn cakes (Harper 1958:25).

In 1799, Benjamin Hawkins made the additional observations that Creek hickory nut processors pounded the nuts in a mortar and winnowed the pieces "to free the kernels as much as possible from the shells" (cited in Talalay et al. 1984:352). Hawkins also distinguished between hickory nut oil, which was separated when it rose to the top after water was added to the winnowed, pounded nuts, and "the milk," which remained below and was not separated.

John Lawson's observation of hickory nut use by unspecified Carolina Piedmont natives in 1701 is unusual in that it describes consumption of solid nutmeat fragments rather than milk or oil. Lawson (1709:98) observed nuts broken "very small betwixt two stones till the Shells and Kernels are indifferent small; And this Powder you are presented withal in their Cabins, in little wooden Dishes; the Kernel dissolves in your Mouth, and the shell is spit out." Lawson (1709:98–99) described another dish, however, "the Soup which they make of these Nuts,

beaten, and put into Venison-Broth, which dissolves the Nut and thickens, whilst the Shell Precipitates, and remains at the bottom. This Broth tastes very rich."

Use of finely pounded hickory nutmeat to flavor and thicken soups and gruels obviously persisted among the eastern Cherokees. Writing about early nineteenth century Cherokee diet in the southern Appalachian region, Malone (1956:132) mentioned that a "tasty and frequent dish was ***ca-nu-chi*** (or ***car-nut-chee***), consisting of corn meal mush mixed with crushed hickory nuts." It is not clear if Malone was applying a term he knew only from the twentieth century to early nineteenth century hickory nut soup or if he had evidence for much earlier use of the food's name. We assume it is a very old Cherokee word. It appears in a 70-page manuscript written in English by a Cherokee woman, Wahnenauhi, sent by her from Oklahoma in 1889 to the Bureau of American Ethnology (Keys 1966). Wahnenauhi, whose English name was Lucy Lowrey Hoyt (Mrs. Lucy L. Keys after her marriage) graduated in 1855 from the Cherokee Female Seminary in Tahlequah and recorded valuable historical and cultural information in this manuscript. Major John Wesley Powell, Director of the B.A.E., wrote to her, however, "You will . . . understand that its value to the Bureau is comparatively small," attempting to justify a purchase price of $10 (Kilpatrick 1966:182). In the manuscript, Keys (1966:194) tells about a band of eastern Cherokees who migrated as far west as the Rocky Mountains in the early eighteenth century (before 1730) to get away from White settlers:

> Although the greater part of the Tribe was very unwilling to have them leave, yet, finding their efforts to persuade them to remain, were unsuccessful, they assisted them in making preparations for the journey: some furnished "pack ponies," while others loaded them with "Cuh-whe-si, tah" [hominy], "Cuh-nuh-tsi," dried venison, and other things. . . .

In an editorial footnote, Kilpatrick (in Keys 1966:194) describes ***cuh-nuh-tsi*** as a soup made of hominy and crushed hickory nuts and says the Cherokee people consider it to be their national dish.

Myra Perry (1974), whose M.A. thesis focuses on wild plant foods used by Cherokees living on or near the Quallah Reservation in North Carolina, recorded a description of "ko-nu-chie" processing during her independent fieldwork, quoting Lish Sneed, a Cherokee elder, as specifying that hickory nuts are pounded between two stones, but the shells and meats not separated by hand because "you know that you can't shell a hickory nut." According to instructions provided to Perry by Geneva Welch, another elder, the fine, greasy meal is formed into a ball about two inches in diameter and dissolved into a quart of boiling water: "As it melts, you have soup. You would describe it more or less as a beverage. Sweetening with sugar is optional" (Perry 1974:40). This recipe calls for the formation of balls, which were not mentioned in earlier accounts, but it does not break nut processing into the two stages of cracking and pounding that we found to be the rule in Oklahoma today.

A slightly earlier recipe collected from the same region, however, does specify the two-stage process. In the book *Cherokee Cooklore* (Ulmer and Beck 1951), detailed instructions for making hickory nut soup ("ga-nu-ge") are shared by Aggie Lossiah, granddaughter of the nineteenth century Cherokee chief John Ross. This

recipe, collected in 1949–1950, is quoted here in full here because it corresponds closely to the way *ku-nu-che* is made today in eastern Oklahoma, yet retains traditional aspects that we know about only as memories:

> Gather hickory nuts or scalybarks, dry on a rack before the fire. When the nuts are dry crack them by using a large flat rock placed in a flat basket lined temporarily with a cloth, use a smaller rock to pound the nuts when placed on the larger rock. When the nuts are all cracked sieve them through a sieve basket. Place the kernels and small hulls that passed through the sieve in the corn beater and pound until the substance can be made into balls. Roll this into balls until ready for use. These balls will keep fresh for several days if the weather is not too warm.
>
> When ready for Hickory Nut Soup place a ball or more in a vessel that will hold water, pour boiling water over the balls while stirring constantly. If this is made into a thick soup it may be served with any type bread or dumpling. If it is made into a thin soup it may be used as a drink. As soon as enough soup has been poured off to leave a very thick mixture more water may be added. Do not drink the very last of the mixture because that is where the little bits of hulls are (Ulmer and Beck 1951:48).

CHEROKEE KU-NU-CHE BALL MAKERS

Six experienced producers of *ku-nu-che* balls generously shared their methods and motives with us during the course of this study (1996–1999). Their tools and techniques might not be representative of all Cherokees who engage in the cracking and pounding of hickory nuts today. These individuals all speak English in addition to the Cherokee language and all live in easily accessible locations, facts that might distinguish them from non-English speakers in more remote, rural areas, although only two of their households had telephones in 1999. Nevertheless, our consultants were all raised in families where Cherokee was spoken and where traditional Cherokee values were taught.

Two are retired men, Blue Rock and Daniel Beaver, both of whom lived until recently in Tahlequah (pop. 10,400) and made *ku-nu-che* balls in their homes. Sadly, Blue Rock passed away in October, 1999. Daniel Beaver moved to a smaller town in northeastern Oklahoma at approximately the same time. Narcy Holcomb is a homemaker whose children are teenagers and young adults. Mrs. Holcomb lives in a rural community a few kilometers southeast of Tahlequah and makes *ku-nu-che* balls in and near a shed behind her house. Ramona and Charley Carey are a semi-retired couple with grown children. They live in a rural community 20 km west of Tahlequah and move between a shed behind their house and their kitchen when making *ku-nu-che* balls. Patrick Bearpaw is a 21-year old college student and musician who, when not at school in Muskogee, Oklahoma, lives a few kilometers east of Jay, a town of 2,220 souls located 70 km north of Tahlequah. He makes *ku-nu-che* balls on the porch of his parents' home.

We observed only Blue Rock and Narcy Holcomb in the actual process of cracking and pounding nuts. Daniel Beaver has recently retired from making *ku-*

nu-che, but allowed us to examine his tools. The Careys and Patrick Bearpaw were interviewed during the summer, when balls are rarely made, but they, too, demonstrated their tools and described their production methods.

GATHERING THE NUTS

Modern makers of ***ku-nu-che*** balls either gather nuts themselves from accessible trees they know to be good producers or barter bags of nuts collected by people who furnish them to primary producers in exchange for a few balls. Several of our consultants pursue both strategies, remaining flexible from year to year. Ramona and Charley Carey rely primarily on nuts gathered themselves from the property of non-Indian neighbors who grant permission without any interest in using the nuts themselves or in receiving ***ku-nu-che*** balls.

We spoke to nobody who goes into heavily wooded areas to collect hickory nuts, even though hickory trees comprise one of the dominant genera of the oak-hickory forests of northeastern Oklahoma. Most if not all gathering takes place in anthropogenically-opened locations: yards, parks, savanna-like pastures and hayfields, and fence rows. Patrick Bearpaw, for example, frequently gathers nuts from the grounds of his church—Pineridge Baptist Church—on the outskirts of Jay. Clients who bring him bags of nuts usually gather them in their yards. We speculate (but have no firm evidence) that many of the hickory trees left standing on Cherokee-owned property have been recognized as valuable sources of nuts for ***ku-nu-che,*** like native pecan trees left uncut across the Southeastern United States.

Ongoing selective management whereby the heaviest nut producers (the



FIGURE 2.—Blue Rock in the process of cracking nuts inside a cardboard box in the bedroom of his home in Tahlequah, Oklahoma.



FIGURE 3.—Narcy Holcomb's Stage 1 cracking tools.

"thrifty" trees) are favored by clearing away competitors for sun and root space probably differs little from pre-Contact management practices in the homeland of the Cherokees and other Southeastern tribes. Although hickory trees growing in closed-canopy forests produce fewer nuts that are much harder to gather given the undergrowth and unchecked competition from squirrels (Talalay et al. 1984), some are likely to have been gathered on occasion, especially during hard times. Wilma Mankiller, former Principal Chief of the Cherokee Nation, for example, includes hickory nuts as one type of wild plant food gathered by her large family when she was a child, along with walnuts, wild onions, dandelions, poke, mushrooms, berries, and wild grapes (Mankiller and Wallis 1993:34). She does not specify, however, that the nuts were gathered in the woods.

All source trees shown to us belong to the species *Carya texana* Buckl., by far the most common upland hickory in northeastern Oklahoma. Although tree books, including *Trees of Arkansas* (Moore 1986), refer to this species as the Black

TABLE 1.—Summary of ku-nu-che makers and their tools.

Maker(s):	Daniel Beaver	Charley and Ramona Carey	Patrick Bearpaw	Narcy Holcomb	Blue Rock
Background:	Retired elder	Semi-retired elders	21-year-old college student	Active homemaker	Retired elder (passed away Oct., 1999)
Processing site:	Apartment in Tahlequah	Shed, yard, and kitchen of home in rural area near Hulbert	Front porch of house in rural area near Jay	Shed and yard of home in rural area near Tahlequah	Bedroom of home in Tahlequah
Stage 1 tools (for cracking):	Hammer on concrete slab	Iron wedge on cylindrical iron pedestal	Wooden pestle on flat rock with concavity in center	Custom-made metal tool on round metal base	Custom-made metal mallet on rectangular metal base
Sifting implements:	Not observed	Metal colander with additional holes punched through	Plastic bowl through which he punched holes	Standard kitchen colander	Large coffee can with holes punched through bottom
Stage 2 tools (for pounding):	Metal curtain weight (8 inches long) in hand-made wooden box with metal insert	Custom-made (rebar & sledge hammer head) pounder in hollowed-out tree trunk mortar	Hand-made wooden pestle in large coffee can	Custom-made wooden pestle in large tin can	Aluminum baseball bat (Bombat™) in cast iron stock pot
Sources of hickory nuts:	Some gathered himself in local parks; some furnished by clients	Most gathered themselves from non-Indian neighbors' land in open woods and pastures	Some gathered himself from yards & churchyard; some furnished by clients	Furnished by friends and clients; some gathered herself from unspecified locale	Furnished by friends and clients, mostly from trees growing in their home yards
Primary motives:	To supplement income and to supply to friends	To ensure availability to friends, family, and themselves	To supply ku-nu-che to father's old clients and to earn spending money	To ensure availability to friends, family, and other Cherokee people	To supplement income and to have for personal use

Hickory, Cherokee *ku-nu-che* makers do not use that common name. Other than distinguishing "scalybarks" (*C. ovata* [Miller] K. Koch), they classify hickory trees simply as "hickernuts." None of them expressed a preference for any particular kind of hickory nut, although a few specified that "pignuts" (the local name for *C. cordiformis* [Wang] K. Koch), are too bitter. Thick-shelled species such as *C. lacinosa* (Michaux f.) Loudon and *C. ovata* (Miller) K. Koch that grow primarily on terraces of larger streams are known to be gathered by people who have access to them.

Cherokee people like and eat pecans (*C. illinoensis* [Wang] K. Koch), few of which grow in the Cookson Hills surrounding Tahlequah, but cannot use them for ***ku-nu-che*** either because of the hard, sharp septal tissues or the failure of pecan meat to form the correct constituency of ***ku-nu-che*** when pounded, or both (our consultants disagreed on the limiting factor). Black walnuts (*Juglans nigra* L.), like pecans, are much easier than hickories to shell by hand and do not lend themselves to mass pounding due to the ridged nutshell that traps bitter-tasting residue from the messy outer hull.

Yields of hickory nuts, like those of pecans and walnuts, fluctuate from year to year. Producers and consumers of ***ku-nu-che*** expect that nuts will be rare during bad years, and take the fluctuations in stride. We managed to purchase a few balls from Narcy Holcomb in June, 1999, even after two consecutive bad years, but most people today seem reconciled to wait for the next bumper crop. Fortunately, this occurred in the fall of 1999.

THE PROCESS OF MAKING KU-NU-CHE BALLS

Before processing can begin, hickory nuts must be dried for several weeks. Boxes or bags of whole nuts are left near a wood stove if either the nut gatherer or the ***ku-nu-che*** ball maker has one in their home. The meat of well-dried nuts separates more readily from the shell than does the meat of freshly fallen nuts.

Ku-nu-che producers use a diverse array of tools for cracking and pounding hickory nuts, but people we interviewed all divide the process into two main stages. First, nuts are cracked one at a time. Narcy Holcomb uses and Blue Rock used custom-made metal tools (See Table 1 for a summary) that were welded for them in machine shops. Blue Rock's nutcracker was a mallet made from two hollow metal pipe segments welded at right angles to each other (Figure 2). The openings at the ends of the shorter segment, which come into actual contact with the nuts, are covered by metal. Blue Rock set each nut, one at a time, on a base consisting of a flat, rectangular iron block approximately 25 cm long, 13 cm wide, and 4 cm thick. As shown in Figure 2, the block was set inside a cardboard box, and cracked nuts were then pushed off to the sides. Narcy Holcomb uses a metal, semi-cylindrical cracking tool designed by her husband, with an expanded, flat working end opposite a rounded end that she covers with a cut-off sock to protect her hand (Figure 3). For supporting the nuts she uses an iron base set inside a box, like Blue Rock, but her metal base is round. Daniel Beaver and the Careys also use metal cracking tools: a standard hammer and a large (18–20 cm long), unhafted, firewood-splitting wedge, respectively. Mr. Beaver cracks nuts on a concrete slab. The Careys crack nuts on top of a cylindrical iron pedestal less than



FIGURE 4.—Patrick Bearpaw holding the wooden pestle passed down from his grandfather, Lee Watermelon, to his father and then from his father to him. Patrick uses the wider end of the pestle to crack nuts on a flat rock with a concavity in the center, and he uses the narrower end to pound the sifted nuts inside a coffee can.

13 cm in diameter and approximately 10 cm high. This pedestal is placed inside a box lined with a towel or other fabric. Several of the older consultants said they preferred metal to stone hammers because metal will not spall, but acknowledged that they used stone tools in the past or else had observed others using smooth, round rocks.

Patrick Bearpaw uses the slightly wider end of a ca. 1.2 meter long wooden pestle that was passed down from his grandfather for cracking nuts (Figure 4). He cracked the nuts on top of a flat rock that he reported had become increasingly concave with use. Because this rock had been lost after the winter of 1998–99, he expected to search stream beds for a new rock for the 1999 season.

Nuts must be cracked one at a time in order to avoid contaminating the ball with worms or with bitter, spoiled nutmeat. Patrick Bearpaw's wooden pestle is wide enough on the nut cracking end to handle several nuts at a time, but he stressed that he cracks one nut at a time—occasionally two at the very most—so that he will not have to discard good nutmeat mixed with bad during multiple crushing. One or two initial blows reveal whether or not the nutmeat is usable. Each good nut is cracked into rather large pieces during the cracking stage. After five to ten whacks, the fragments—shell and all—are pushed off the metal, stone, or concrete base onto the lining of the box, and the next nut is cracked.

Between the first stage (cracking) and second stage (pounding), larger pieces of nutshell are removed by sifting. Narcy Holcomb uses a large-holed aluminum colander (Figure 5), and the Careys use a standard kitchen colander through which they have punched a number of larger holes (Figure 6). Blue Rock used a 2 lb 7 oz coffee can with screwdriver-sized holes punched in the bottom (Figure 7), and Patrick Bearpaw uses a plastic bowl with holes punched in it. The Careys and Patrick Bearpaw save the nutshell to be used as fuel in their wood-burning stoves. The others currently discard the nutshell, although Blue Rock burned it when he lived in the country and had a wood stove.

The second stage involves pounding the nutmeat together with the small pieces of nutshell that passed through the holes of the sifter. This process is necessary not only to crush the solid fragments into very small pieces, but also to release the fats into an oily or "gummy" constituency that allows the meal to be shaped into balls. Our consultants engage in pounding for 30 minutes or more per batch. The Careys use large batches—a dishpan-full—and have a large wooden mortar, so it can take 50 minutes of pounding before the meal is ready to be shaped into balls.

Pounding tools and basins, again, vary according to the individual specialist. The Careys, who use a traditional, hollowed-out wooden tree trunk or "stump" as a mortar (Figure 8), have the most unconventional "pestle," custom-made from four segments of ca. 1.4 meter long reinforcing bar ("rebar") welded at one end onto the long sides of an unhafted sledge hammer head (Figure 9). Narcy Holcomb uses a ca. 60 cm long wooden pestle custom-made by her husband for pounding ***ku-nu-che*** (Figure 10). She sits on a chair and pounds inside a large tin can. Blue Rock used an aluminum baseball bat (Bombat™ brand) to pound inside an iron stockpot (Figure 11). Daniel Beaver uses a heavy cylindrical steel curtain weight to pound ***ku-nu-che*** inside a square-sided wooden box that he made and affixed to a wider and heavier wooden base for steadiness. A square sheet of thin



FIGURE 5.—Metal colander used by Narcy Holcomb to sift larger pieces of nutshell after cracking and before pounding.



FIGURE 6.—Metal colander used by the Careys to remove larger pieces of nutshell between cracking and pounding.

metal is inserted into the inside floor of the box to form the pounding surface. This avoids splintering and allows the box to last longer.

Ku-nu-che balls tend to vary between 7 cm and 9 cm in diameter. Towards the end of his career, Daniel Beaver began selling the ***ku-nu-che*** meal loose inside plastic baggies rather than shaping it into balls, reasoning that the first step in the soup-making process is to break the ball back up into loose meal or dissolve it in hot water.

DISTRIBUTING THE PRODUCT

All but one of our experts sell their products without advertising. ***Ku-nu-che*** balls are sometimes commissioned ahead of time, with avid patrons furnishing the maker with more than enough hickory nuts to meet the buyers' needs, as mentioned earlier. Other interested clients begin inquiring about availability in November and December, and information spreads through the grapevine. Three of our consultants had no telephones, and it is likely that quite a few people who end up with their ***ku-nu-che*** balls also live without telephones. Word of mouth, therefore, is still a key mechanism for ***ku-nu-che*** distribution. Much of this communication takes place at church gatherings.

Patrick Bearpaw volunteered that people drive to his house to buy ***ku-nu-che*** balls from 50 or 60 miles (up to 100 km) away. Whitekiller and McIntosh have both observed balls in the offices of employees of the Cherokee tribal government and at Cherokee-run hospitals and health clinics. These balls had either been purchased on the premises or were available for purchase if one were to ask. Some



FIGURE 7.—Coffee can with holes punched through the bottom used by Blue Rock to remove larger pieces of nutshell before Stage 2 pounding.



FIGURE 8.—Hollowed-out tree trunk used by the Careys as a mortar for pounding already cracked and sifted hickory nuts.

of these balls, in the recent past, were produced by Blue Rock and Daniel Beaver. Patrick Bearpaw, Narcy Holcomb, and the Careys easily sell as many balls as they want to distribute out of their homes.

Members of the Cherokee community know that they can buy ***ku-nu-che*** balls in the late fall and early winter. Unused balls can be wrapped in aluminum foil and plastic baggies and stored in a freezer for several years. Uncracked nuts can be stored for months in a dry place such as behind a wood burning stove, but it appears that little nut processing in Oklahoma occurs after January and before November. Much of the hickory nut soup is served seasonally, as well, for Thanksgiving and Christmas holiday dinners. Frozen balls are saved for later occasions such as birthdays and anniversaries. Ramona Carey and her associates have served ***ku-nu-che*** soup made from the previous year's balls on the grounds of the Tsa-La-Gi Heritage Center for many years during Cherokee National Holiday,



FIGURE 9.—The Carey's pestle: four rods of "rebar" (reinforcing bar) welded onto a sledgehammer head. The rods are taped together with duct tape. Mr. Carey holds the tool upside down in this photograph to display the pounding end.

which is held over Labor Day Weekend, in early September. The Careys also enjoy eating ***ku-nu-che*** at the monthly gatherings of their large family.

COOKING HICKORY NUT SOUP

A ***ku-nu-che*** ball contains many small fragments of nutshell. Two balls, both made by Narcy Holcomb, were weighed separately before cooking and the nutshell weighed afterwards, having been strained through a flour sifter. The balls were found to consist of between 22% and 25% nutshell by weight. The recipe from *Cherokee Cooklore* (Ulmer and Beck 1951), provided above, does not call for straining to remove the nutshell, but rather for leaving a residue of nutshell fragments in the bottom of the pot. Everyone we consulted, however, including several



FIGURE 10.—Wooden pestle used by Narcy Holcomb for pounding nuts inside a metal can.

cooks who buy ***ku-nu-che*** balls but do not make them themselves, remove the shell fragments after dissolving the ball in hot water. The recipe in *Cherokee Cooklore* is also unusual in that it does not specify mixing melted hickory meal with hominy or rice, although it does mention bread or dumplings. Our experiences indicate that contemporary Cherokee cooks in Oklahoma usually use rice, but recognize that cracked hominy would be more traditional. Ramona Carey still prefers hominy, cooking it overnight in her crock pot before preparing ***ku-nu-che***.

Melvina King, a neighbor of Patrick Bearpaw, was kind enough to demonstrate the soup-making procedure in her kitchen. First, she boiled one-half bag of white rice in a large pot, cooking the rice until soft but leaving much water unabsorbed. When the rice was cooked, she put the ball into a one-quart (ca. 1 liter) measuring cup and added about two cups (ca. 0.5 liter) of hot water from the tap (other cooks said to add boiling water). The ball melted into a milky

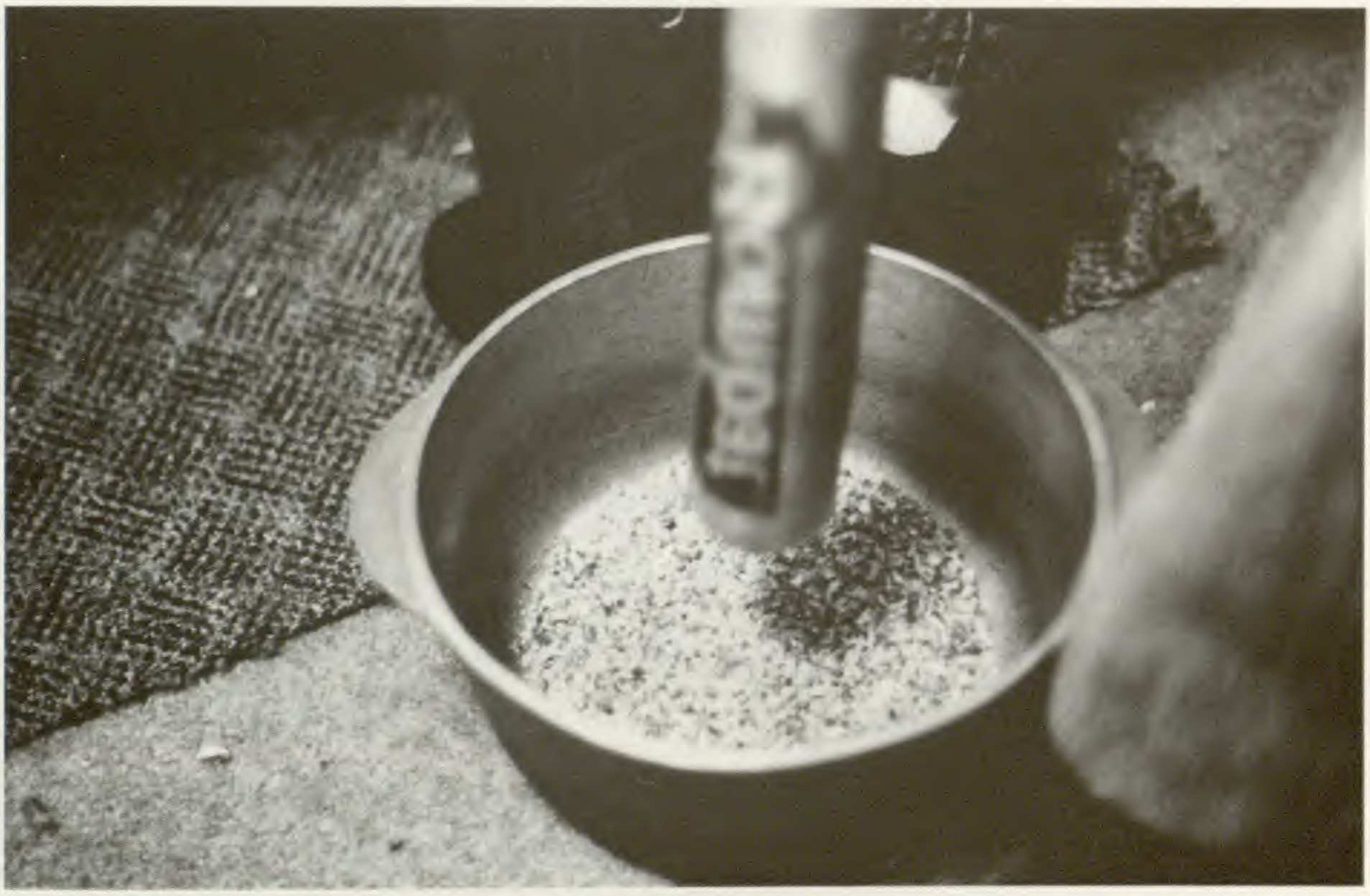


FIGURE 11.—Blue Rock's baseball bat (Bombat™) in use as a pestle, pounding cracked and sifted nuts inside a stockpot.

emulsion. Breaking up the lumps with a fork, Mrs. King poured this thick white fluid into a bowl through a standard flour sifter to remove the nutshell, and then added the hickory solution to the hot rice and unabsorbed water. Patrick Bearpaw said that a cloth is used for straining nutshell in his family, and Ramona Carey uses a sifter without a metal stirring apparatus (Figure 12). As the published recipe indicates, degree of thickness is a matter of personal preference.

Few Cherokees today, young or old, eat ***ku-nu-che*** without sweetening it with sugar. Due to health concerns, Mrs. King adds artificial sweetener rather than sugar. A few people we talked to said they know someone who prefers salt to sugar, and salting rather than sweetening the soup seems to have been more common in the past. ***Ku-nu-che*** is served hot, but eaten at community gatherings after it has cooled to room or outdoor temperature. The high fat content causes the soup to thicken as it cools. Those fortunate enough to have leftovers in their refrigerators can enjoy cold ***ku-nu-che***.

WHY MAKE KU-NU-CHE BALLS TODAY?

The people we interviewed who spend many hours each year cracking and pounding hickory nuts engage in this task for three main reasons. First, they are making a product that other members of their family and community desire. The product is particularly significant because it is a traditional Cherokee food, passed down through countless generations and key to the survival of their ancestors during famines. Narcy Holcomb's commitment extends to reintroducing ***ku-nu-che*** to native Muscogee communities near Okmulgee, west of Cherokee country,

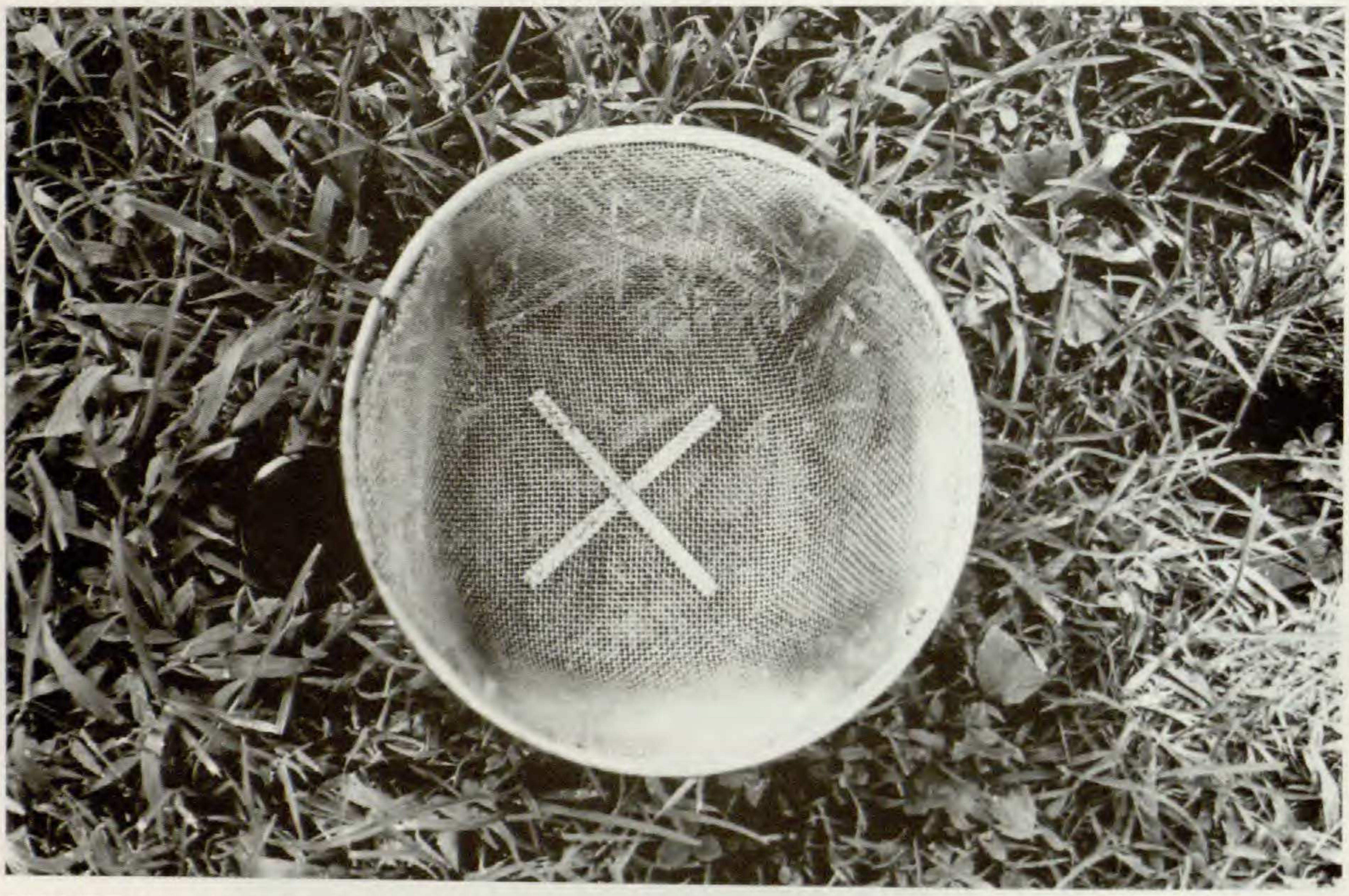


FIGURE 12.—Ramona Carey's sifter for straining out small pieces of nutshell while cooking hickory nut soup. Other cooks use muslin cloth or flour sifters with rotating handles.

where the tradition of hickory nut pounding seems to have been discontinued (Muscogee people prefer sofkee, a food more traditional for their tribe, made from sour corn meal mash). Second, most Cherokee nut processors enjoy eating ***ku-nu-che*** very much and want more than a few balls for themselves and their households. Blue Rock was the most avid ***ku-nu-che*** eater encountered during our study. His response to the question, "Why do you make ***ku-nu-che***?" was "I *love* ***ku-nu-che***."

Three of our consultants (see Table 1) also engage in the making of ***ku-nu-che*** in large or small part for economic reasons. When Patrick Bearpaw's father stopped making ***ku-nu-che*** four or five years ago, Patrick saw an opportunity to earn a significant amount of money as a teenager while working at home. At the same time, however, he knew he was providing a highly valued product to older relatives and other members of his father's clientele. The work is very hard, everyone agrees. Patrick Bearpaw was happy that it got easier as he grew and gained strength. Ramona and Charley Carey did not make ***ku-nu-che*** balls when they were younger because the balls had always been cheap and easy to buy in the past. When sources were no longer available, however, they took on the task.

We found it difficult to obtain quantitative information such as the number of hours spent gathering, cracking, and pounding nuts; total number of balls made in any given year; or amount of money earned. Blue Rock volunteered that by early January, 1998, he had earned $400.00 selling ***ku-nu-che*** that season. He had one more burlap bag full of nuts to process at the time. Few if any of our consultants make more than 100 balls per year, and the going price is $5.00 to

$6.00 per ball. Patrick Bearpaw's mother told about a year when her husband made 100 balls within a few days and had badly swollen hands.

In addition to those who make dozens of ***ku-nu-che*** balls for distribution, there are many other Cherokee men and women, probably helped by adolescents and children, who crack, sift, and pound enough hickory nuts for their families to have hickory nut soup at Thanksgiving, Christmas, or some other special occasion.

THE FUTURE OF KU-NU-CHE

In order to assess how younger Cherokees viewed ***ku-nu-che***, a survey was administered in April, 1996, by Whitekiller to 28 female students living in the dormitory and attending Sequoyah High School, a Cherokee Nation tribally operated boarding school in Tahlequah. The students ranged in age from 14 to 19 years and represented 18 various North American tribes, diverse in singular or multi-tribal heritage. Twenty-four (86%) of the students claimed tribal affiliation belonging to either the Cherokee or Creek, with each of these tribes representing an equal number of 12. In addition to the question determining tribal affiliation, students were asked the following questions:

1. What is your favorite food?
2. Do you know what ***ku-nu-che*** is? (A NO answer terminated the survey.)
3. Have you ever eaten ***ku-nu-che***?
4. If so, on what occasion: (a) family gathering; (b) church gathering; (c) cultural gathering such as a stomp dance; (d) holiday such as Christmas, New Year's Day, or Thanksgiving; (e) no special occasion?
5. How often do you eat ***ku-nu-che***: (a) one time only; (b) about once a year; (c) about once a month; (d) about once every two weeks or more often?
6. How important do you think ***ku-nu-che*** is to Indian culture: (a) very important; (b) somewhat important; (c) not at all important?
7. Do you know how to make ***ku-nu-che***? If so, who taught you how to make it: (a) grandparent(s); (b) parent(s); (c) other relative; (d) someone else?
8. If you do not know how to make ***ku-nu-che***, would you be interested in learning how to make it? If YES, who would you ask to teach you: (a) grandparent(s); (b) parents(s); (c) other relative(s); (d) someone else?

Eighteen (64%) of the students listed their favorite food as being pizza or hamburgers, with the remainder naming their preferred cuisine as Mexican, Chinese or "Indian tacos." When asked about ***ku-nu-che***, 14 (50%) of the students answered they did not know what it was, nor had they ever tasted it. Of this number, nine (64%) claimed no Cherokee tribal affiliation. Four others identified multi-tribal lineage including Cherokee. One student who identified herself as being only Cherokee did not know what ***ku-nu-che*** was and had never tried it.

Fourteen (50%) students reported they knew what ***ku-nu-che*** was, and 12 of the 14 had tried this food. For those who were familiar with ***ku-nu-che***, 11 (79%) named themselves as being Cherokee, while three (21%) claimed no Cherokee tribal affiliation. The two respondents who stated they had not tried it claimed Native heritage to more than the Cherokee tribe. When asked about the occasion(s)

on which *ku-nu-che* was served, nine students (64% of those familiar with it) reported it was served on holidays such as Christmas and Thanksgiving. Two (14%) answered that *ku-nu-che* was present at family gatherings, with the remaining three respondents indicating they had seen this food served at cultural gatherings, church meetings, and for no special occasion, respectively.

In response to the question, "how often do you eat *ku-nu-che*?," five (42% of those who had eaten it) answered they had it once a year. Four (33%) reported they had tried it one time, two (17%) had it about once a month, and one (8%) indicated she ate it about once every two weeks or more often.

Six (50%) of the 12 students who had eaten *ku-nu-che* responded they believed it to be 'very important' to Indian culture. Out of these six, two indicated they knew how to make it and were taught to make it, in one case by her parents and in the other case by 'someone else.' The remaining four stated they would be interested in learning how to make *ku-nu-che,* with two indicating they would ask their parents or another relative to assist her. Two responded they would ask someone other than family to teach them how to make it.

Five (42%) of the students stated they believed *ku-nu-che* to be 'somewhat important' to Native culture. Four of these five indicated they would be interested in learning how to make it and would ask their grandparents or other relatives to teach them. One responded that although she thought *ku-nu-che* was somewhat important to Native culture, she had no interest in learning how to make it. All of these students with the exception of one responded that they were members of the Cherokee tribe. The remaining student (not identified as Cherokee) indicated she thought *ku-nu-che* was not at all important to Native culture and she had no interest in learning how to make it.

To summarize the results of this survey, half of the 28 high school females residing in a Native American boarding school in Tahlequah and representing various tribal affiliations were familiar with *ku-nu-che*. Most of the students who knew what *ku-nu-che* was and had eaten it identified themselves as Cherokee and reported they had eaten the food at least once a year during holidays. All but one of this group of students indicated they believed *ku-nu-che* was very important or somewhat important to Native culture. Most in this group who did not know how to make it expressed a desire to learn and stated they would ask their parents or another relative to teach them.

In spite of a drop-off in frequency of *ku-nu-che* use during the late twentieth century, the tradition is still fairly strong. A demand for the balls exists in Tahlequah as well as rural parts of Cherokee, Sequoyah, Adair, and Delaware Counties. Men and women of various ages have demonstrated their willingness to take on the work of cracking and pounding hickory nuts after available sources dried up. When asked if any of her children had made *ku-nu-che* balls themselves, Ramona Carey said no, but that she herself had not done so at their age either, and somebody who now depends on her and her husband might well take over when they stop. This statement reinforces the Sequoyah High School student survey regarding students' perceptions of the importance of *ku-nu-che* making for continued Cherokee traditions and culture. Mrs. Carey pointed out that the process is labor-intensive and tedious, but straightforward. The tools are not elabo-

rate, and no extended training period is required. Any motivated, able-bodied person can do the job. Incentives are both economic and cultural.

ARCHAEOLOGICAL IMPLICATIONS OF MODERN KU-NU-CHE

The early ethnohistoric record, to our knowledge, makes no mention of solid balls made of sifted and pounded hickory nutmeat mixed with smaller pieces of nutshell. Therefore, archaeologists have emphasized liquid products, especially the milk and oil rendered from boiling nutmeat and cracked nutshell (e.g., Gardner 1998; Reidhead 1981; Talalay et al. 1984). Cherokee people commonly use metal tools to make ***ku-nu-che*** balls today, but most use stone or wooden tools in at least one stage of the process, and all report that their ancestors used stone and wooden tools to make ***ku-nu-che*** in both the near and distant past. We can think of no technological reasons to dismiss the practice of forming nutmeat and shell into balls before European contact, and good reasons to infer that native people—especially those who were not fully sedentary or who gathered hickory nuts some distance from their dwellings—reduced the weight and bulk of the nuts by making balls close to the source. This would have been easier than carrying either bags of whole nuts or pots or skins full of oil when overland transport was necessary. This strategy might not have been workable in parts of the country where warm weather persists into late autumn, because balls would have spoiled within weeks without refrigeration. Many parts of the Eastern Woodlands, however, are cool enough by November for storing oily balls for several weeks at least.

Archaeological reports that include only counts or only weights of nutshell are inadequate for determining whether or not an assemblage represents the actual cracking and pounding stages. A low total nutshell weight—even with a relatively high nutshell fragment count—might be interpreted as indicating that hickory nuts were insignificant at a site where a great deal of pre-sifted nutmeat mixed with many small pieces of shell had been imported from elsewhere. A ratio such as number of fragments of nutshell divided by their weight would be more revealing than count or weight alone, although post-depositional factors at specific sites must be carefully considered.

A second ethnoarchaeological implication of modern ***ku-nu-che*** making is that the process involves two main stages: first cracking and then pounding, with sifting in between. Cracking is conducted one nut at a time so that bitter nutmeat and worms do not contaminate the meal. This is significant for at least two reasons. First, archaeologists who have experimented with cracking hickory nuts found the process to be more time-efficient when they started *and ended* with a wooden mortar and pestle in which numerous nuts could be crushed all at the same time, rather than reducing nuts to small pieces using *only* a grinding stone and hand-held mano that could crush only one or two nuts at a time (Reidhead 1981). It seems, however, that the process is not initiated in the mortar, although Patrick Bearpaw does use a wooden pestle to crack nuts—one at a time—over a large stone base. Regardless of which tools are used for Stage I cracking, each nut is whacked only a few times. Cherokee ***ku-nu-che*** ball makers do not use Stage I tools to render nuts into small pieces. Instead, they eliminate large pieces of coarsely cracked shell by sifting, then transfer the loosened nutmeat and small-

er shell fragments to a mortar or mortar-like metal container for pounding into fine particles.

Another implication of the two-stage process is obviously that two sets of tools would have been seen as necessary or at least highly desirable. Archaeologists tend to associate wooden mortars and pestles with maize rather than nuts, but mortars—both wooden and bedrock—may have been used for thousands of years before maize was introduced into eastern North America. It is extremely interesting that wooden mortars are identified as "*ku-nu-che* blocks" or "*ku-nu-che* stumps" at two historical sites in eastern Oklahoma: Tahlonteeskee (Figure 13), and the birthplace of Sequoyah, inventor of the Cherokee alphabet. This terminology would be consistent with a developmental sequence in which wooden mortars retained their original Cherokee name even after they came to be used mostly for pounding maize rather hickory nuts. Even in regions where all nuts were rendered directly into milk or oil rather than into an intermediate solid ball form, a two-stage process means that two sets of tools were probably involved whenever possible.

A final lesson learned from modern *ku-nu-che* makers is that they consider hickory nutshell to make good fuel, and some people burn it in their wood stoves even today. This is a minor point, but the question has been raised during discussions of taphonomy and the degree to which hickory nutshell is over-represented in the archaeological record (see Lopinot 1982:729). Frequent use of nutshell for fuel is likely to have increased the numbers of fragments in the archaeological record of open sites and wet rockshelters, even though many specimens would have burned to ash in the process. If hickory nutshell had not been routinely and purposefully burned as fuel, a far higher proportion would have rotted away over the years.

CONCLUSIONS

Hickory nuts were for thousands of years a staple food and the source of cooking oil and soup stock used by ancestors of the Cherokees and other Eastern North American Indians. After intensification of maize agriculture (ca. 1000 c.e.), hickory nuts remained a highly valued supplement. They were the source of flavorful oil and stock used for cooking various dishes in which maize was usually the primary ingredient. Hickory nuts also constituted a critical fallback or famine food in years when crops failed. Several hundred years after initial European contact, the practice of rendering hickory oil apparently ceased, but the process of cracking and then pounding nuts and shells *en masse* and storing them in the form of balls to be cooked either alone or with hominy in soup-like dishes survived. Throughout the twentieth century, the Cherokee dish known as *ku-nu-che* persisted as a highly appreciated and frequently-to-occasionally served traditional delicacy.

Makers of *ku-nu-che* balls in Oklahoma today are pragmatic and flexible about their tools. Non-traditional implements are used if old-style stone or wooden tools are unavailable. Metal tools have advantages over stone tools that might spall or shatter and wooden tools that might decay. Several producers have built or commissioned unique tools used only by themselves for the purpose of crack-

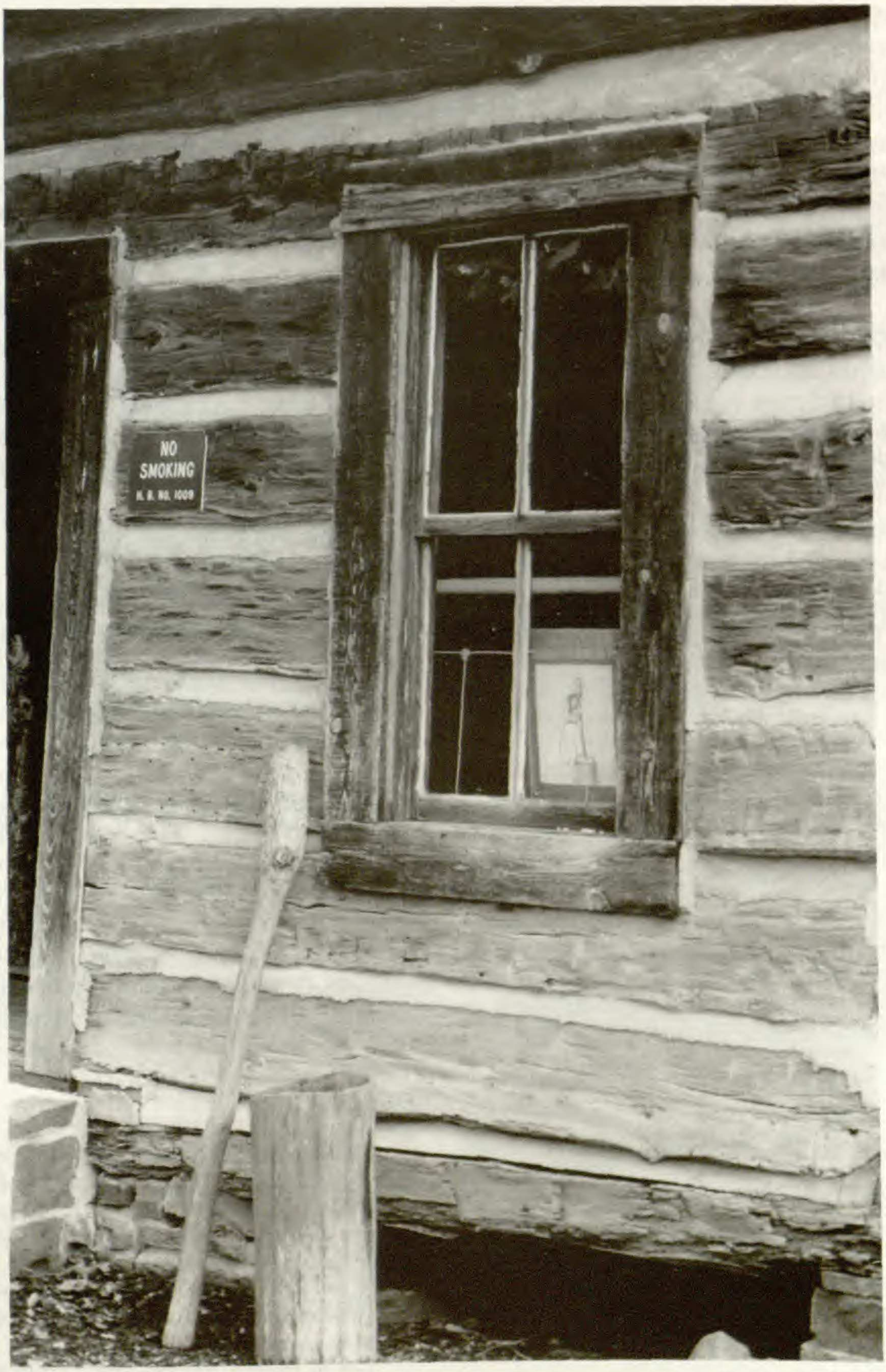


FIGURE 13.—Traditional wooden mortar and pestle on display at Tahlonteeskee, near Gore, Oklahoma, capital of the Western Cherokee Nation between 1828 and 1839. The sign in the window shows a Cherokee woman using a mortar and pestle, along with the words "Ga-Na-Ge Ka-No-Na: The big end gives weight to pound corn (***selu***) or hickory nuts (***ga-nu-ge***) in the (***ka-no-na***) or stump."

ing or pounding hickory nuts. Sifting baskets have been replaced by metal colanders and sifters. In spite of the popularity of new, modern tools and the use of tools that look very different from their ancient counterparts, the process always proceeds through the stages of cracking nuts one at time, sifting out the larger pieces of nutshell, and then pounding the smaller pieces of shell and nutmeat until enough oils are released to allow the maker to form the mixture into balls. The making of balls out of hickory nuts may not have been described ethnohistorically, but we see no reason to doubt that the practice has considerable antiquity.

Today, hickory nut soup is served less frequently than in the past, but all signs point to its survival. Although the production of ***ku-nu-che*** balls consumes a good deal of time and demands physical labor, no lengthy apprenticeship or extraordinary skills are required, and appropriate tools can be purchased or fashioned without great expense. Younger Cherokees demonstrate the motivation to carry on the tradition out of dedication to their heritage, a desire to reinforce cultural identity, and a sense of responsibility to satisfy the desires of elders, combined with the incentive to make extra money. We hope that ***ku-nu-che*** will be enjoyed by tens of thousands of Cherokees for generations to come.

ACKNOWLEDGMENTS

We are grateful beyond measure to Patrick Bearpaw, Daniel Beaver, Ramona and Charley Carey, Narcy Holcomb, and Blue Rock for sharing their valuable knowledge. We extend sincerest sympathy to the Rock family and thank them for allowing us to observe some of the last ***ku-nu-che*** making hours of their beloved grandfather, father, and husband. Among the many other people who helped us during this project, we are indebted to Florence Cornell, Johnny and Luke Drywater, Lois Johnson, Melvina King, Julie Reid, and Betty Smith. Mrs. Cornell's aid was especially crucial in that she helped conduct the survey at Sequoyah High School and shared ***ku-nu-che*** traditions. Mrs. Smith told us how she makes ***ku-nu-che*** and provided useful comments on a draft of the manuscript. Sincere thanks go to Fiona Marshall, Nancy Turner, and Patty Jo Watson for also reading earlier drafts of the paper and suggesting improvements. Maria Bruno and Pascal Boyer kindly furnished the Spanish and French abstracts. Research was partially funded by a Faculty Research Grant from the College of Arts and Sciences, Washington University in St. Louis.

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